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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,323	06/08/2001	G. Benjamin Hocker	19441/101/101	9409

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EXAMINER

CHAN, ALEX H

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/877,323

Applicant(s)

HOCKER ET AL.

Examiner

Alex H Chan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2 and 3.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the wavelength selective optical switch must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 28 is objected to because of the following informalities: a wavelength selective optical switch as claimed is not shown in the drawing. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. **Claim 25** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, applicants recite "calculating a position and orientation of each diffraction grating element." However,

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specification does not provide sufficient teachings as to how calculating a position and orientation is carried out as well as relaying such information so that the wavelength band of the incoming light uses this calculation to be directed to a predetermined output location in a way so as to enable one skilled in the art to which it pertains to make or use this invention.

4. **Claim 31** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, applicants recite “determining locations of the plurality of diffraction grating elements.” Though applicants disclose means for adjusting or positioning the diffraction grating elements, for example, via controller, applicants have not provide sufficient teachings as to how the location of diffraction grating is determined and which component carries out such operation in a way so as to enable one skilled in the art to which it pertains to make or use this invention.

5. **Claim 25** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, applicants do not specifically point out how the calculation of position and orientation is done and by which component carries out such calculation.

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6. **Claim 26** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, specification does not provide sufficient information as to what constitutes a wavelength selective optical switch and how wavelength selective optical switching is done.

7. **Claim 31** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, specification does not distinctly point out as to how determining locations of the plurality of diffraction grating elements is accomplished.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1-2 and 23-24** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S.

Patent No. 6,486,462 B1 to Rumer.

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Regarding claims 1-2 and 23-24, Rumer discloses an apparatus for processing light (Fig. 4), comprising: (a) an emitter (40 and 57) for transmitting light including multiple wavelength bands (e.g. WDM, Col. 1, line 61-Col. 2, line 2) generally along an axis, each band including a distinct related range of collateral wavelengths (e.g. 1310, 1510, 1520, 1530, 1540 or 1550 nm); (b) a plurality of spatially positioned receptors (e.g. different one of 41-45 and the corresponding fiber each is coupled with); (c) a diffracting member (e.g. Bragg diffraction grating, 46 and Col. 7, lines 17-19) for diffracting said wavelength bands to various of said receptors (Col. 5, lines 5-25); and (d) a controller (e.g. 54, 55 and 56) for selectively adjusting (i.e. varying) said diffracting member to independently vary the receptor to which each wavelength band is diffracted (Col. 5, lines 26-37).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 1-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,421,179 b1 to Gutin et al (hereinafter Gutin) in view of Rumer, and further in view of U.S. Patent No. 5,905,571 to Butler et al (hereinafter Butler).

Regarding claims 1-4, 7, 9-11, 18, 21, 23, 26 and 27, Gutin discloses an optical processor (Fig. 1) comprising: (a) an optical input (via 100) transmitting a plurality of

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copropagating optical signals (e.g. information regarding wavelengths), each signal having a distinct wavelength band (e.g. WDM with plurality of channels, Col. 4, lines 25-46); (b) a plurality of optical outputs (120, 122, 134, 136, 140, 142, 144, 146); (c) a variably controllable diffraction grating member (108) including a plurality of diffractive (i.e. reflective) elements (Fig. 2, 4 and 6); and (d) to control the wavelength bands (e.g. by applying voltage to electrode leads to actively reconfigure the diffraction grating to appropriate configuration) so as to direct the plurality of copropagating optical signals to selected one or more of said optical outputs (e.g. for specified wavelength distribution to appropriate detectors, Col. 10, line 10-Col. 11, line 28).

Gutin does not explicitly disclose a controller operatively connected to the variable diffraction grating member. Rumer discloses a controller (e.g. 54, 55 and 56 of Fig. 4) operatively connected to the variable diffraction grating member (e.g. Bragg diffraction grating, 46 and Col. 7, lines 17-19). Accordingly, one of the ordinary would have been motivated to employ the above feature so as to adjust the position of the Bragg grating for passing wavelengths to other nodes (Col. 3, lines 9-13 and Col. 7, lines 36-38). Therefore, it would have been obvious to one artisan from the same endeavor at the time the invention was made to modify the diffraction grating of Gutin by incorporating a controller coupled with diffraction grating because this provides adjustment to the position of the Bragg grating for passing wavelengths to other nodes as suggested by Rumer.

Still, Gutin in view of Rumer does not disclose one of the relative phase shift and amplitude of said copropagating optical signals processed by each element is individually controlled. Butler discloses one of the relative phase shift and amplitude of said copropagating optical signals processed by each diffractive element (24, 12' and 12" of Fig. 1b) is individually

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controlled (Col. 7, line 66-Col. 8, line 5 and Col. 8, line 50-Col. 9, line 9). Accordingly, one of the ordinary would have been motivated to employ the above feature so as to provide an optical apparatus with at least one diffraction grating having plurality of grating elements that maybe programmed for the correlation analysis of an incident light beam received from a source or for analysis of different materials of interest (Col. 2, lines 16-64). Therefore, it would have been obvious to one artisan from the same endeavor at the time the invention was made to modify the diffraction grating of Gutin in view of Rumer by incorporating to control the relative phase shift and amplitude of copropagating optical signals because this helps to provide one diffraction grating having plurality of grating elements that maybe programmed for the correlation analysis of an incident light beam received from a source or for analysis of different materials of interest as suggested by Butler.

Regarding claim 5, Gutin in view of Butler discloses wherein said controller is programmed (e.g. via programmable diffraction grating, Col. 2, lines 38-42, Gutin or Col. 2, lines 16-37, Butler)

Regarding claim 12, Gutin in view of Butler discloses optics (104 of Fig. 1, Gutin or 57 of Fig. 4, Rumer or 20 of Fig. 1b, Butler) intermediate said optical input and said variable diffraction grating member to direct a copropagating optical signal onto said variable diffraction grating member (Col. 4, line 66-Col. 5, line 5, Gutin or Col. 6, lines 55-64, Butler).

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Regarding claim 13, Gutin in view of Rumer and Butler discloses optics (118 and 132 of Fig. 1, Gutin or 41-45 of Fig. 4, Rumer or 26 of Fig. 1b, Butler) intermediate said variable diffraction grating member and an optical output to direct a copropagating optical signal onto a corresponding, selected optical output (Col. 5, line 66-Col. 6, line 42, Gutin or Col. 8, lines 6-49, Butler).

Regarding claims 14 and 16, Gutin in view of Rumer discloses wherein said optical input comprises an emitting end surface of an optical fiber or a light-emitting region of an optical wave guide (e.g. via 100 of Fig. 1, Gutin or via 40 of Fig. 4, Rumer).

Regarding claims 15 and 17, Gutin in view of Rumer discloses wherein optical outputs comprise end surfaces of respective optical fibers or input surfaces of respective optical wave guides (120, 122, 134, 136, 140, 142, 144, and 146 of Fig. 1, Gutin or via 58 of Fig. 4, Rumer).

Regarding claims 8 and 19, Gutin in view of Rumer and Butler discloses elements of said variable diffraction grating member are transmissive (e.g., transmissive via 12' to 26 and 16 of Fig. 1a, Butler or transmissive via 46 to 41-45 of Fig. 4, Rumer).

Regarding claims 6 and 20, Rumer discloses all limitations as discussed above and further discloses wherein diffractive elements are controlled by said grating member to vary the relative positions thereof to effect diffraction of the wavelength band of each copropagating optical signal (Col. 5, lines 13-65 and Col. 8, lines 25-32).

Regarding claims 22 and 30, Rumer discloses wherein said controller is electrically operated or electrostatically adjusts the position of each of said grating elements (e.g. via voltage or feedback control signal, Fig. 4 and Col. 8, lines 26-29).

Regarding claim 24, Gutin in view of Rumer discloses allowing redirection of each wavelength band to a different one of multiple receptors (e.g. 120, 122, 134, and 136 of Fig. 1, Gutin or the fibers which 41-45 are coupled respectively, Fig. 4, Rumer).

Regarding claims 25 and 31 (as far as understood), Rumer discloses all limitations as discussed above, and further discloses calculating (i.e. determining) a position and orientation of each diffraction grating element (e.g. via 49, 51, 53, 59, 56 and 55 of Fig. 4) necessary to direct a wavelength band of the incoming light to a predetermined output location (Col. 5, lines 26-37); and positioning the diffraction grating elements in calculated positions and orientations (via 54 of Fig. 4) to diffract the wavelength bands of light to predetermined output locations.

Regarding claim 28 (as far as understood), Gutin discloses all limitations as discussed in rejecting claim 10, and further discloses a wavelength selective optical switch (e.g. switching and wavelength selection, Col. 11, line 55-Col. 12, line 6).

Regarding claim 29, Rumer discloses all limitations as discussed above, and further discloses wherein adjustment of said grating elements changes the direction (e.g. to its corresponding collimators) in which each wavelength band of light is individually and selectively (e.g. based on course of frequency) diffracted to predetermined locations (e.g. according to wavelength, Col. 5, lines 5-12).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Clarke is cited to show a mirror (diffraction grating) coupled with a processor and program for redirecting spectral components (Fig. 1). Bishop is cited to show an array of mirrors coupled with controller for reflecting lights (Fig. 2 and 4). Kartalopoulos is cited to show a diffraction grating coupled with a controller for reflecting output lights from fiber at varying angle or phase (Fig. 1 and 2). Kramer is cited to demonstrate a reflective and transmissive diffraction grating (Fig. 5). Mermelstein et al is cited to show a similar optical processor structure (Fig. 7). Shih et al is cited to show a controller coupled with prism rotator and lens actuator (Fig. 1). Brock is cited to show a diffraction grating having a rotatable mounting (Fig.

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3). Clark is cited to show an optical signal processor comprising a controller in the form of a processor and a diffraction grating (Fig. 1). Suzuki et al is cited to show an optical switching comprising diffraction grating (Fig. 1-3). Kramer (US 5,986,778) is cited to show another similar optical processor structure comprising diffraction grating coupled with a rotor (Fig. 1). Tearney et al is cited to show similar art in utilizing diffraction grating (Fig. 11).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Chan

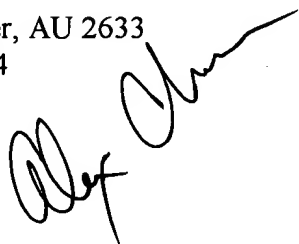
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Patent Examiner, AU 2633

March 2nd, 2004

A handwritten signature in black ink, appearing to be "Alex Chen", written over the date.


LESLIE PASCAL
PRIMARY EXAMINER